

Amendments to the Claims

Please cancel claims 27-36 and substitute new Claims 37-46 directly therefor. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Withdrawn) A method for monitoring condition of a material, said method comprising:
representing the condition of the material with multiple states, at least one of the states observable with an inspection;
using the multiple states with a model to estimate state progression; and
scheduling an inspection based on the progression of the multiple states.
2. (Withdrawn) A method as claimed in Claim 1 wherein the states comprise a damage state.
3. (Withdrawn) A method as claimed in Claim 1 wherein the states comprise a precursor state.
4. (Withdrawn) A method as claimed in Claim 1 wherein the model is used to pre-compute a database of damage progression conditions as a function of the states for rapid assessment of damage condition for decision support.
5. (Withdrawn) A method as claimed in Claim 1 wherein the states are selected to ensure observability of a particular damage progression behavior mode.
6. (Withdrawn) A method as claimed in Claim 1 wherein at least one of the multiple states is an initially preassumed crack size.
7. (Withdrawn) A method as claimed in Claim 1 wherein the inspection is performed by a nondestructive evaluation method.

8. (Withdrawn) A method as claimed in Claim 1 wherein the inspection comprises onboard diagnostics.
9. (Withdrawn) A method as claimed in Claim 1 wherein the inspection comprises eddy current sensors mounted on a surface of the material.
10. (Withdrawn) A method as claimed in Claim 1 wherein at least one of the states is fatigue.
11. (Withdrawn) A method as claimed in Claim 10 wherein fatigue damage progression is monitored continuously.
12. (Withdrawn) A method as claimed in Claim 10 wherein fatigue damage progression is monitored occasionally.
13. (Withdrawn) A method as claimed in Claim 12 further comprising:
increasing frequency of inspection for fatigue damage progression monitoring as the damage progresses.
14. (Withdrawn) A method as claimed in Claim 1 wherein the model is adapted as the states progress.
15. (Withdrawn) A method as claimed in Claim 1 wherein the material is part of an aircraft component.
16. (Withdrawn) A method as claimed in Claim 15 further comprising:
deciding disposition of a component based on the material condition states.
17. (Withdrawn) A method as claimed in Claim 16 wherein the disposition comprises aircraft maintenance.

18. (Withdrawn) A method as claimed in Claim 16 wherein the disposition comprises repair or rework.
19. (Withdrawn) A method as claimed in Claim 16 wherein the disposition comprises airworthiness.
20. (Withdrawn) A method as claimed in Claim 1 further comprising:
monitoring rates of change of states.
21. (Withdrawn) A method as claimed in Claim 21 wherein the rates of change of selected states are determined from inspections at at least two different times.
22. (Withdrawn) A method as claimed in Claim 1 further comprising:
selecting a health control action designed to achieve a quantitative goal according to a control algorithm.
23. (Withdrawn) A method as claimed in Claim 22 wherein the control action is rework.
24. (Withdrawn) A method as claimed in Claim 23 wherein the rework is shot peening.
25. (Withdrawn) A method as claimed in Claim 22 wherein the quantitative goal is a reduction of total ownership cost without reducing readiness.
26. (Withdrawn) A method as claimed in Claim 25 wherein the quantitative goal is constructed from an assessment of available quantitative current and historical information combined with expert qualitative information.

27-36 (Cancelled)

37. (New) A method for health control of an article comprising:
 - examining material condition of an article with an eddy current sensor;
 - determining presence of an early stage damage, based on a variation of an absolute electrical property;
 - performing a health control action on the article if early stage damage is present;
 - after the health control action is complete or if no early stage damage is detected, establishing a baseline condition for an absolute electrical property; and
 - with the eddy current sensor, performing future inspections that use this baseline condition for comparison to make decisions based on article health.
38. (New) A method as claimed in Claim 37 wherein the eddy current sensor is a sensor array.
39. (New) A method as claimed in Claim 37 wherein the sensor is mounted to a surface of the article.
40. (New) A method as claimed in Claim 37 wherein the sensor is scanned over a surface of the article.
41. (New) A method as claimed in Claim 37 further comprising:
 - integrating the health control action with scheduling of inspections.
42. (New) A method as claimed in Claim 37 wherein the health control action is blending out of early stage damage to extend life.
43. (New) A method as claimed in Claim 42 wherein the shot peening is performed after blending out.
44. (New) A method as claimed in Claim 37 wherein the electrical property is electrical conductivity.

45. (New) A method as claimed in Claim 37 wherein the electrical property is magnetic permeability.
46. (New) A method as claimed in Claim 37 wherein the health control action effectively returns the article to original material condition.